

REMARKS

The present invention is a method of encoding a video signal, a method of decoding an encoded video signal, a video encoder, a video decoder and an encoded video signal. A method of encoding a video signal in accordance with an embodiment of the invention representing a sequence of pictures to form an encoded signal comprises temporally independent INTRA pictures and temporally predicted pictures. The INTRA pictures and at least some of the temporally predicted pictures are used to form reference pictures for the temporal depiction of pictures in a video sequence comprising indicating an encoding order of those pictures used to form reference pictures in the encoded video signal with a sequence indicator having an independent numbering scheme, such that consecutive pictures used to form reference pictures in encoding order are assigned sequence indicator values that differ with respect to each other by a predetermined amount independent of a numbering scheme of non-reference pictures encoded between successive reference pictures. See page 6, lines 21-32, through page 7, lines 1-2, and page 12, lines 30-32, et seq. of the specification for a description of embodiments of the invention involving the utilization of a Referenced Picture Order Number (RPON) which is utilized as a sequence indicator to identify reference pictures in encoding order with sequence indicator values which differ with respect to each other by a predetermined amount. See also the discussion of the RPON code word in Figs. 4, 5 and 7-9.

The utilization of RPON may be that a decoder receives a next frame decoded by a decoder which compares the RPON of the currently received reference frame with the RPON of the previously received and decoded reference

frame and calculates the difference between the RPON. In a preferred embodiment, when the difference to indicate consecutive pictures used to form references pictures is 1, a difference between the previously received and decoded reference frame and the RPON which is 2 or greater, provides an indication that a reference picture has been lost. This permits the decoder to send feedback data to the transmitting video encoder to request the transmitting video encoder to encode a frame as a INTRA-frame so as to stop the temporal error propagation that would result. See page 18, lines 11-21.

Claim 5 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite regarding the utilization of H.263 standard. The claims have been amended to more specifically identify the standard as the H.263 video coding standard. The time reference for viewing the standard is in accordance with the filing date accorded to the present invention since a person of ordinary skill in the art, given the disclosure of the present application and the claims referring to "H.263 video encoding standard", can determine the meaning of the claims according to the accorded filing date. Accordingly, it is submitted that the Examiner's statement that the use of "H.263 standards" renders the claims indefinite is traversed to the extent that if the Examiner now asserts that the "H.263 video coding standard" is indefinite.

Claims 1-2, 4 and 8-9 stand rejected under 35 U.S.C. §102 as being anticipated by United States Patent 6,049,570 (Fukunaga et al). These grounds of rejection are traversed for the following reasons.

Each of independent claims 14, 18, 20, 22 and 50 recites substantively an encoded video signal comprising temporally independent INTRA pictures and

temporally predicted pictures wherein the INTRA pictures and at least some of the temporally predicted pictures are used to form reference pictures for the temporal prediction of other pictures using a sequence indicator having an independent numbering scheme with consecutive pictures used to form reference pictures in encoding order are assigned sequence indicator values that differ with respect to each other by a predetermined amount independent of the numbering of non-reference pictures encoded between successive reference pictures. This subject matter is neither anticipated nor rendered obvious by Fukunaga et al.

Fukunaga et al uses an acknowledgment signal to inform the moving picture coder 100 which is processed by a decoding status determination module 109 to determine if a decoding error has occurred as indicated by an acknowledgement signal not being received within a specified time. See column 5, lines 21-28. The acknowledgement signal indicates which frames or blocks have been decoded by the receiving device. See column 5, lines 15-20. A reference frame updating module 110 operates in response to the determination by the decoding status determination module 109 such that the usual practice is that the reference frame is usually updated each time a frame is received. However, when a decoding error has occurred, the reference frame of the most recent frame for which an acknowledgement signal has been received is utilized as the reference. See column 5, lines 29-42, and column 7, lines 18-50. This operational mode is fundamentally different than the claimed subject matter involving a sequence indicator used such that consecutive pictures used to form reference pictures are assigned sequence indicator values that differ with respect to each other by a predetermined amount and are independent of the numbering of non-reference

pictures encoded between successive reference pictures. With the invention, unlike Fukunaga et al, which focuses on synchronizing a video encoder with the pictures that the decoder has correctly decoded, the present invention enables the decoder to determine a loss by simply determining if the sequence indicator values of referenced frames differ by a predetermined amount. This subject matter is neither anticipated nor rendered obvious by Fukunaga et al. Accordingly, it is submitted that the subject matter of the independent claims is patentable.

Moreover, the dependent claims recite more specific aspects of the present invention which are neither anticipated nor rendered obvious by Fukunaga et al.

Claims 3, 6-7 and 10-13 stand rejected under 35 U.S.C. §103 as being unpatentable over United States Patent 6,169,821 (Fukunaga et al) in view of United States Patent 6,357,028 (Zhu). These grounds of rejection are traversed for the following reasons.

The teachings of Fukunaga et al ('821) are substantively the same as United States Patent 6,049,570 (Fukunaga et al) which has been utilized in the rejection of claims 1, 2, 4 and 8-9 on grounds of anticipation. See, Fig. 1 of Fukunaga et al ('570) wherein the acknowledgement signal is utilized in the same fashion as in Fukunaga et al '821 regarding the moving picture encoders disclosed therein. Therefore, the deficiencies pointed out above with respect to Fukunaga et al ('570) are equally applicable to Fukunaga et al ('821) and will not be repeated herein.

Moreover, the Examiner's reliance upon Zhu is misplaced in that Zhu's general teaching of indicating that a missing packet may be determined by comparing sequence numbers does not suggest the subject matter of the sequence indicator as recited in the independent claims. Accordingly, it is submitted that the

rejection of claims 3, 6-7 and 10-13 under 35 U.S.C. §103 is improper and should be withdrawn with respect to corresponding newly submitted dependent claims.

Newly submitted claims 14-49, 58 and 59 define more specific aspects of the previously filed independent claims and further newly submitted claims 50-57 claim an encoded video signal representing a sequence of pictures which is patentable for the same reasons set forth above.

In view of the foregoing amendments and remarks, it is submitted that each of the claims in the application is in condition for allowance. Accordingly, early allowance thereof is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 C.F.R. §1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (1344.40119X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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Attachments

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